

# System configurations

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## System types

There are five basic systems within the Meridian 1 product line. Their differences are in the architecture of the central processing unit (CPU) or the network and peripherals, with changes made to the system in the Meridian 1 program. These systems are as follows:

- The smaller-sized switches are options 21, 21A, and 21E, which provide from 32 to 600 lines.
- Medium-sized switches are options 51, 51C, 61, and 61C, which can be configured for up to 1500 lines.
- The largest switches are options 71, 81, and 81C, which provide up to 10,000 ports.

## Engineering rules

Each Meridian 1 system is defined using the following assumptions and general engineering rules:

- A system may be upgraded to the next larger system type as defined in *Upgrade system installation* (553-3001-258).
- When expanding to the next system type, the changes to the physical configuration must be kept as simple as possible to reduce downtime and installation costs.
- A module column should be built up to the maximum of four modules before moving to the next new column. In installations where the ceiling does not allow four-high columns, the alternate method of three-high tier configurations can be used.
- Vertical routing of the internal signal cables be done only on the right side of a module.
- The CPU modules must be on the bottom of a column or one level up for proper cooling and reliability.
- The network modules cannot be separated. This means that they must be located in one contiguous equipment bay.
- The IPE modules can be located separately from the CPU and network bay, by up to the maximum network cable length of 45 feet.
- A full-group network consists of two half-group network modules stacked one on top of the other.
- The option 71 and 81 CPU and Core Modules must be next to each other at the same horizontal level. Option 81C Core/Network Modules can also be on top of each other in the first and second tier.
- The intergroup module must be at the top of a column and adjacent to the network modules.
- The RPE module can be located only in the bottom or the next tier higher because of thermal restrictions.
- The Meridian Mail module can only be located in the bottom or the next tier higher because of thermal restrictions.

## Systems

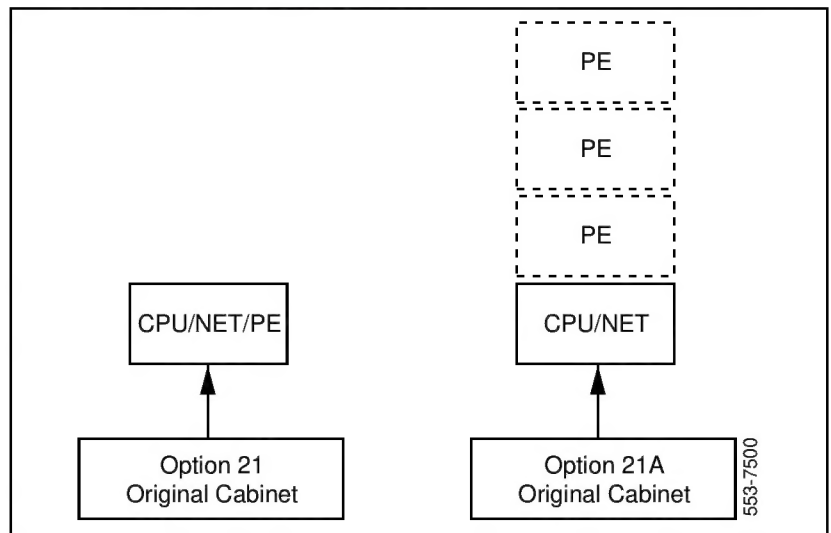
In the figures that follow, each of the boxes represents a module, as viewed from the front of the system. Boxes with dashed lines indicate where additional modules can be placed for expansion. The pedestals and top caps are not shown as they are always required.

All of the figures show the system with contiguous modules. The system can be split because of floor space limitations, system size, and so on. Any division of the system must be made between the PE and the CPU/network modules.

### Option 21, 21A, 21E

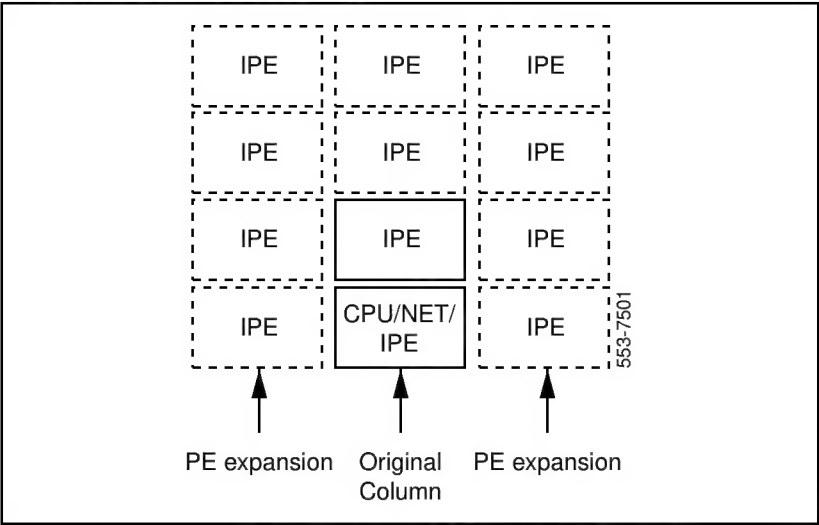
This option consists of a single module that contains the CPU, network, and PE, as shown in [Figure 6](#).

**Figure 6**  
**Minimum size option 21 and 21A**

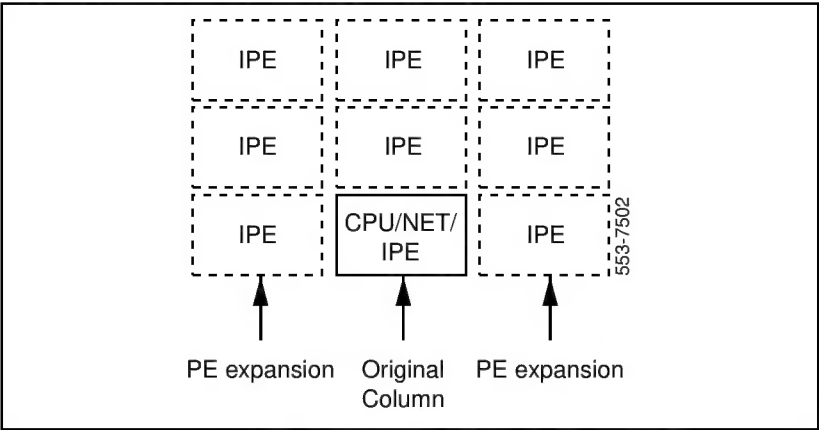


Options 21 and 21E can be expanded by adding more PE modules on top of, and adjacent to, the original module column, as shown in [Figure 7](#). [Figure 8](#) shows the alternate three-high system in a low-ceiling installation.

**Figure 7**  
**Expanded option 21 and 21E**



**Figure 8**  
**Three-tier expanded option 21 and 21E**

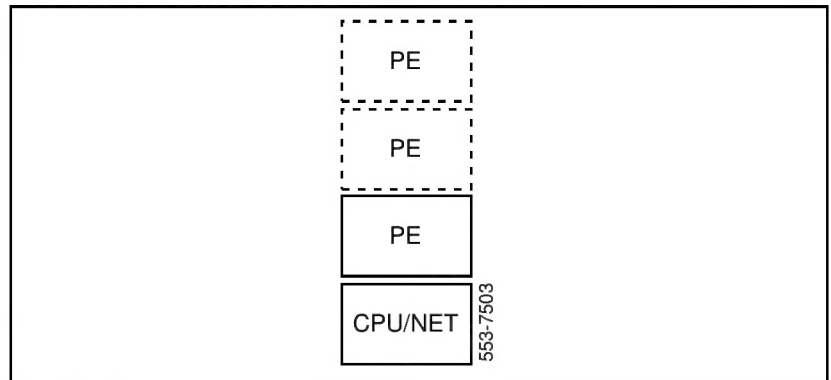


## Options 51, 51C, 61, and 61C

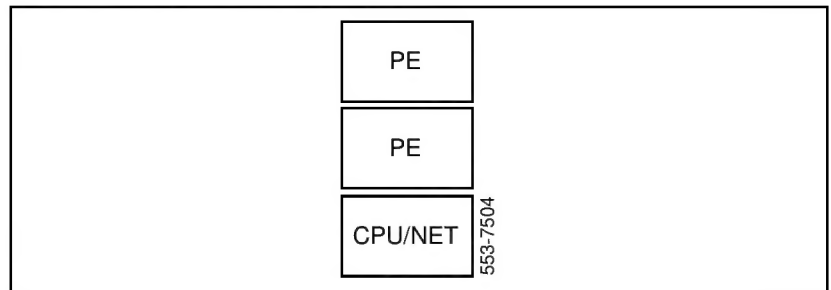
Options 51, 51C, 61, and 61C have CPU and network modules located in the same column with the IPE modules, as shown in [Figure 9](#). The CPU/network modules in options 51 and 61 contain one CPU and a half-group network, while options 51C and 61C contain core/network modules. Options 51 and 51C are a single-CPU and half-group network configuration. Options 61 and 61C have two redundant CPUs and a full group network in two modules.

Installations with low ceilings can use the three-high tiered configuration, as shown in [Figure 10](#). This configuration also applies to the option 51C if you place the core/network module at the bottom of the column in place of the CPU/network module.

**Figure 9**  
**Option 51 configuration**

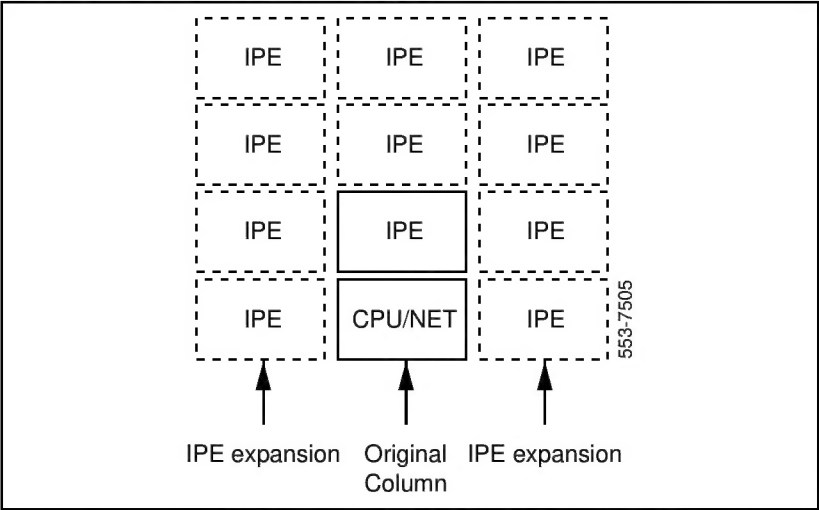


**Figure 10**  
**Three-tier option 51 configuration**

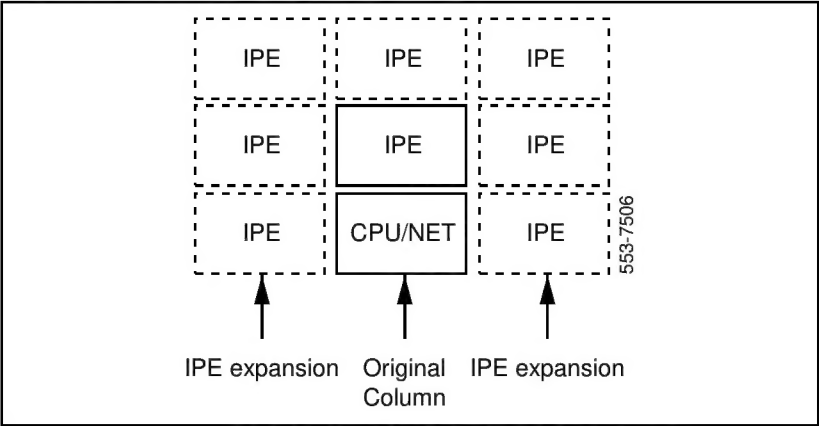


Options 51, 51C, 61, and 61C can be expanded by placing IPE modules on top of or adjacent to the original module column, as shown in [Figures 11](#) and [12](#). In options 51C and 61C, the CPU/Network Module is replaced with the Core/Network Module in the figures below.

**Figure 11**  
**Option 51 or 51C with expanded IPE**

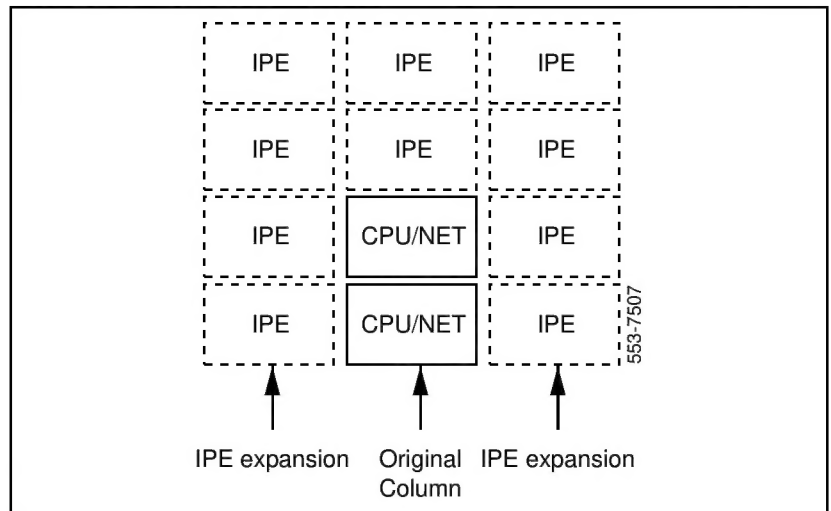


**Figure 12**  
**Three-tier option 51 or 51C expansion**



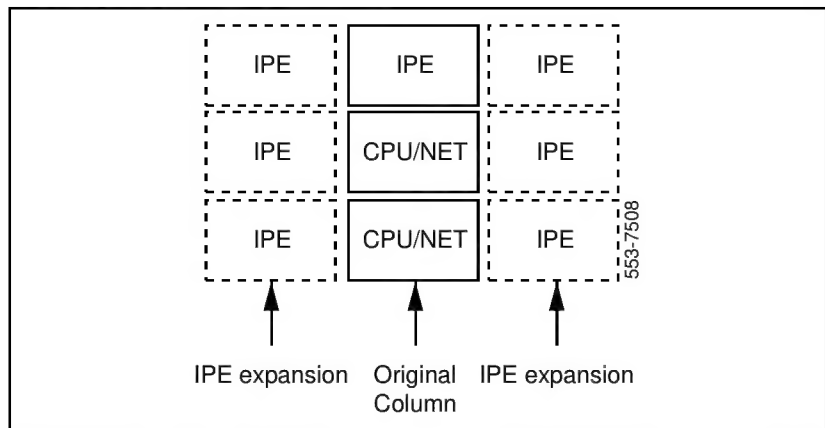
A full-group option 61 or 61C consists of 32 loops, which is the maximum number of loops supported by this option. For option 61, the change to a full network group is implemented by moving the PE module located just above the original CPU/network module, and installing a second CPU/network module in its place, as shown in [Figures 13](#) and [14](#). This also applies to the option 61C when you replace the CPU/network module with a core/network module.

**Figure 13**  
**Option 61 with expanded IPE**

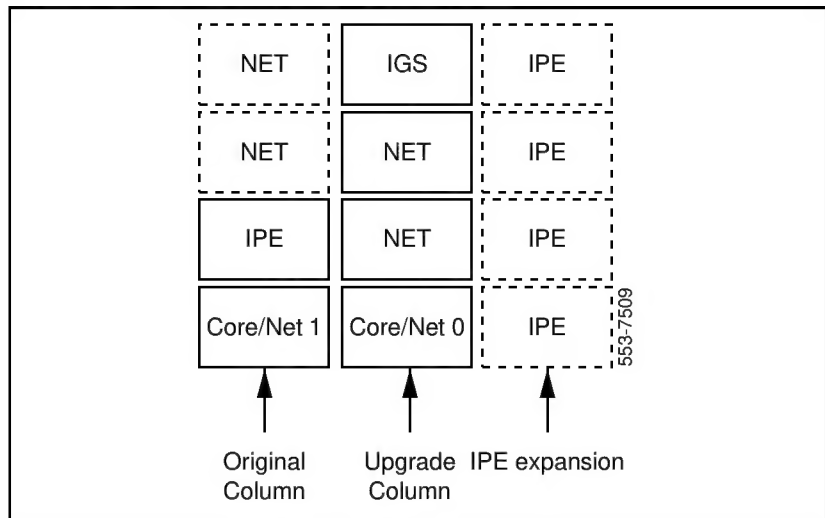


[Figure 15](#) shows an upgrade from the full-group option 61 to the option 71. The upgrade consists of the removal of the option 61 CPU/network modules and the installation of two CPU modules, two network modules, and one intergroup module. Note that in an existing option 61 installation, space must be reserved for the placement of an expansion column to the left of the original module column. In installations where the ceiling height is too low for the four-tier column, a three-tier column can be used, as shown in [Figure 16](#).

**Figure 14**  
**Three-tier option 61 expansion**

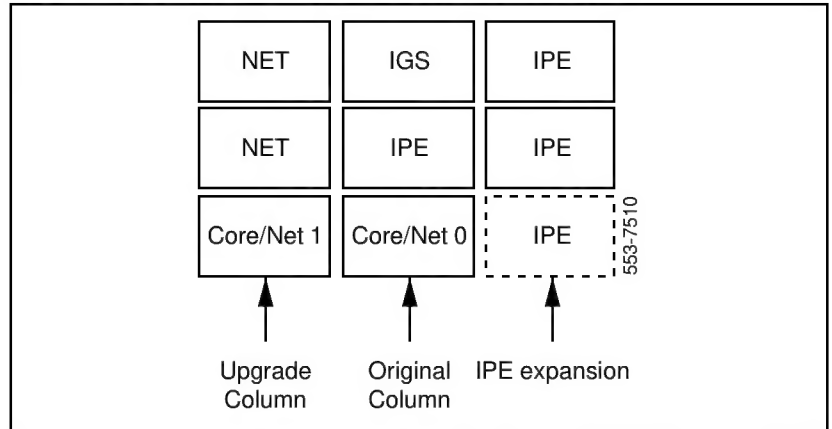


**Figure 15**  
**Option 61 or 61C migration to option 81C**





**Figure 16**  
**Three-tier option 61 or 61C migration to option 81C**



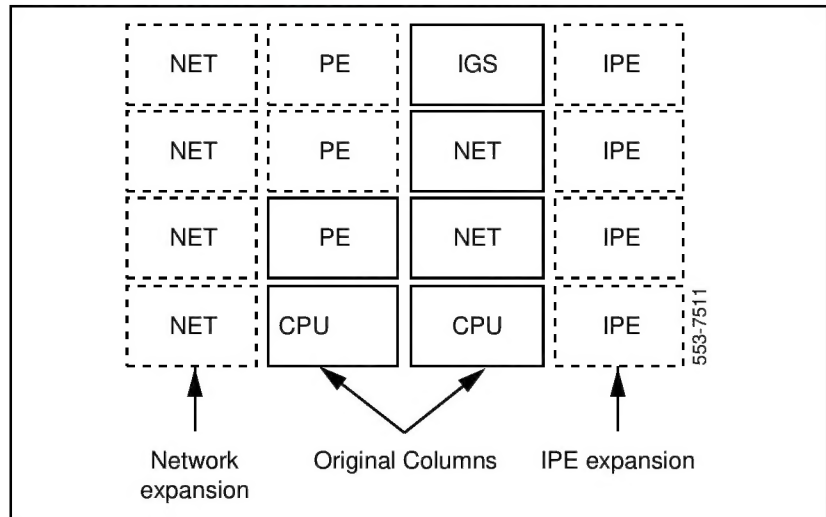
## Option 71

The next largest system type in the Meridian 1 family is the option 71. The option 71 is similar to the option 61 however, the option 71 provides separate modules for the two CPUs and separate modules for the network cards.

In the option 71 configuration the two CPUs are contained in separate modules called CPU modules and the network cards are installed in the network modules. Each network module supports a half group; two of these modules are required for a full group. The option 71 can be expanded in full groups only, up to a maximum of five groups. One intergroup module is required to allow the interconnection of multiple network groups.

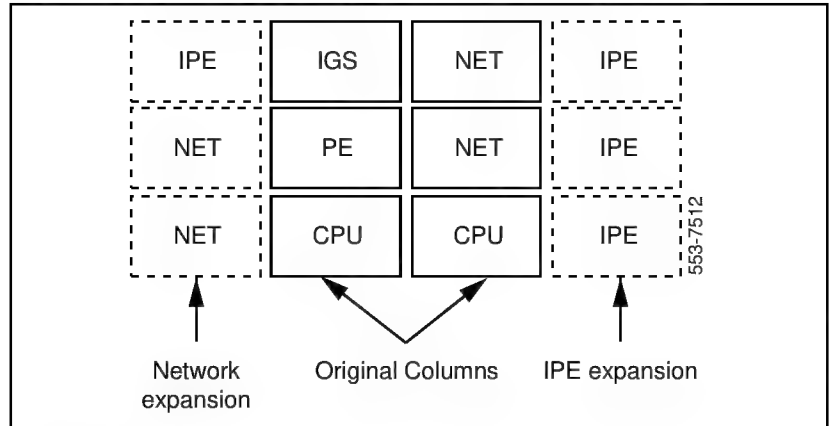
When PE modules are added to the option 71, it is recommended that the expansion be made only to the right of the original columns. This is done to facilitate further network expansion to the left of the original columns, as shown in [Figures 17](#) and [18](#).

**Figure 17**  
**Option 71 allowing space for network expansion**

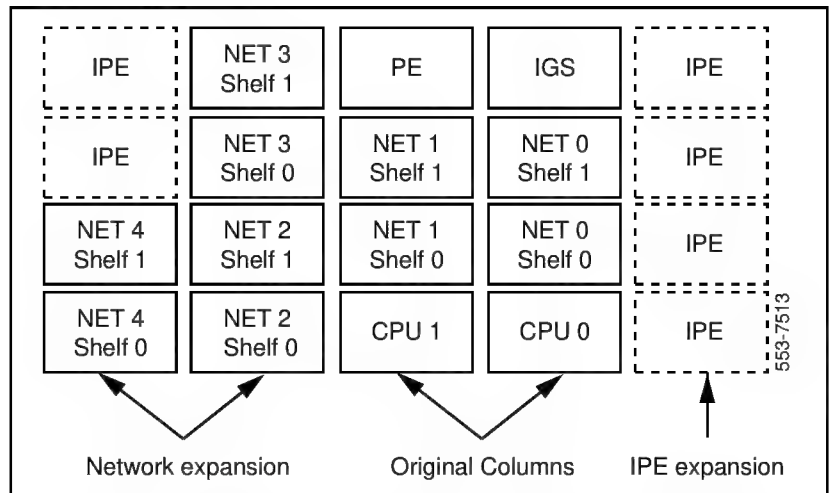


[Figures 19](#) and [20](#) show an option 71 with the full five-group network expansion implemented. Note that the network expansion is to the left of the original module columns.

**Figure 18**  
**Three-tier option 71 allowing space for network expansion**

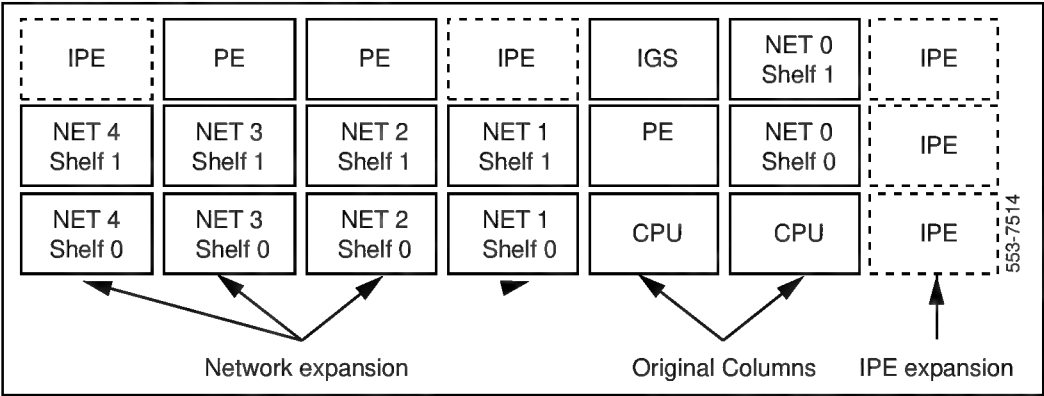


**Figure 19**  
**Five-group option 71**

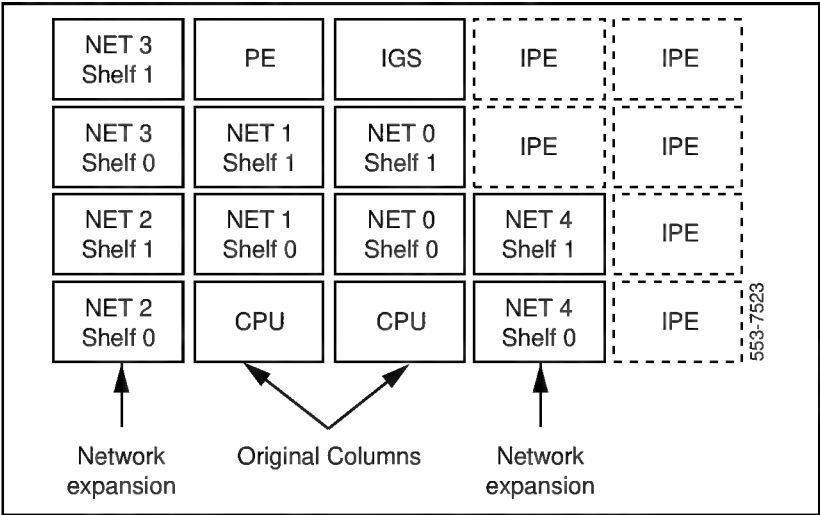


The option 71 in [Figures 21](#) and [22](#) places the fifth network group to the right of the base module system as an alternate to the configuration shown in [Figures 19](#) and [20](#). This allows greater flexibility in floor plans for the larger machines.

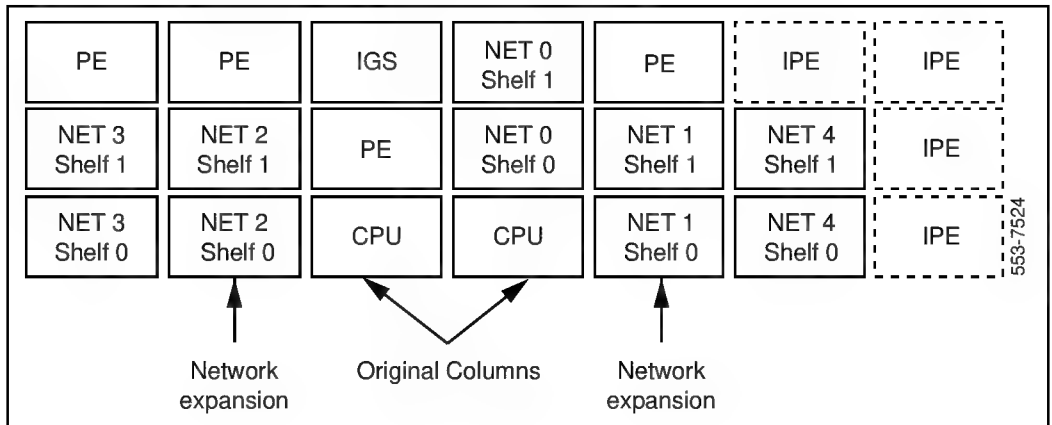
**Figure 20**  
**Three-tier five-group option 71**



**Figure 21**  
**Five-group option 71 alternate configuration**



**Figure 22**  
**Three-tier five-group option 71 alternate configuration**



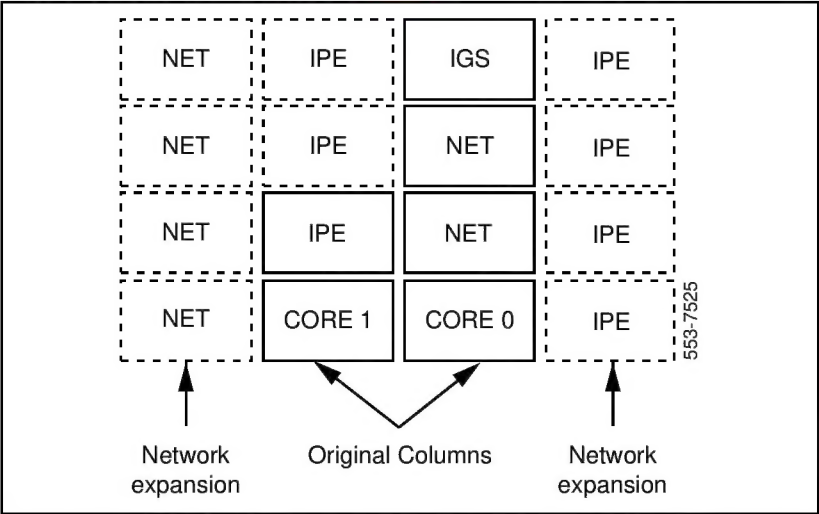
Option 81

In terms of line size, the option 81 does not provide a greater number of lines to the system, but it does provide better performance by improving the system CPU capacity. The option 81 contains a core module in place of the CPU module in other systems.

The core introduces three new circuit packs; CP, IOP, and CNI and a new CMDU. The network and PE hardware components of the option 81 are the same as for option 71.

The current options 61, 61C, and 71 can be upgraded to the option 81 by replacing the CPU/network modules in the option 61 or the core/network modules in the option 61C, or by replacing the CPU modules in the option 71, with core modules. [Figure 25](#) illustrates the basic option 81 configuration.

**Figure 23**  
**Option 81 basic configuration**



**Figure 26** illustrates the option 81 expanded to the maximum of five network groups.

**Figure 24**  
**Option 81 five-group configuration**

|                  |                  |                  |                  |    |     |
|------------------|------------------|------------------|------------------|----|-----|
| DTI              | NET 3<br>Shelf 1 | DTI              | IGS              | MM | IPE |
| DTI              | NET 3<br>Shelf 0 | NET 1<br>Shelf 1 | NET 0<br>Shelf 1 | MM | IPE |
| NET4<br>Shelf 1  | NET 2<br>Shelf 1 | NET 1<br>Shelf 0 | NET 0<br>Shelf 0 | MM | IPE |
| NET 4<br>Shelf 0 | NET 2<br>Shelf 0 | CORE 1           | CORE 0           | MM | AEM |

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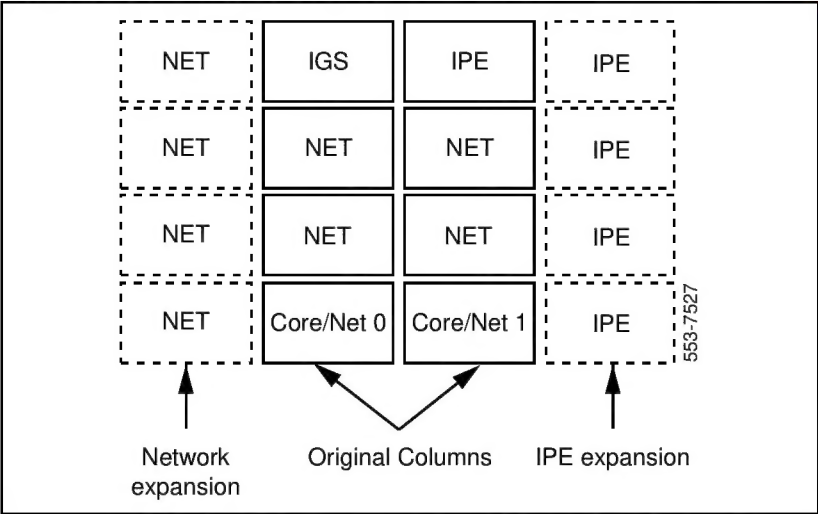
Option 81C

In terms of line size, the option 81C does not provide a greater number of lines to the system than option 81, but it does provide some improvement in performance by improving the system CPU capacity. The option 81C CPUs are located in core/network modules that contain group 0 network equipment.

The system core introduces combination of the IOP and the CMDU into a single pack IOP/CMDU. The network and PE hardware components of the option 81C are the same as for option 81.

The current options 61, 61C, 71, and 81 can be upgraded to the option 81C by replacing the CPU/network modules in the option 61 or the NT9D11 core/network modules in the option 61C, or by replacing the CPU modules in the option 71, with core/network modules. In case of option 61C with NT5D21 core/network modules, the upgrade requires additional cards and network, IGS, and IPE modules. Option 81 can also be upgraded to option 81C, this upgrade does not provide any significant advantages. [Figure 25](#) illustrates the basic option 81C configuration.

**Figure 25**  
**Option 81C basic configuration**





**Figure 26** illustrates the option 81C expanded to the maximum of five network groups.

**Figure 26**  
**Option 81C five-group configuration**

|                  |                  |                  |     |     |
|------------------|------------------|------------------|-----|-----|
| NET 4<br>Shelf 1 | IGS              | IPE              | MM  | IPE |
| NET 4<br>Shelf 0 | NET 2<br>Shelf 1 | NET 1<br>Shelf 1 | MM  | IPE |
| NET 3<br>Shelf 1 | NET 2<br>Shelf 0 | NET 1<br>Shelf 0 | IPE | IPE |
| NET 3<br>Shelf 0 | Core/Net 0       | Core/Net 1       | IPE | AEM |

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